Assistant Engineer-Group-B in the Office of the Chief Engineer Water Resources Department

Year of Advt: 2025 Date of Exam: 18-October-2025

Booklet Serial No. 11261

DO NOT BREAK THE SEAL OF THE BOOKLET UNTIL YOU ARE TOLD TO DO SO

SERIES : I

QUESTION BOOKLET

Subjects : General English, General Knowledge and Agricultural Engineering/ Civil Engineering/Water Resource Engineering

Full Marks : 300 **Time Allowed : 2½ Hours**

Read the following instructions carefully before you begin to answer the questions.

INSTRUCTIONS TO CANDIDATES

1. This Booklet contains **150 questions** to be answered in a separate OMR Answer Sheet using Black Ballpoint Pen in the following three Parts :

Part—A	**General English**	:	**50 questions**
Part—B	**General Knowledge**	:	**50 questions**
Part—C	**[Choose any ONE subject from the following] Agricultural Engineering/Civil Engineering/ Water Resource Engineering**	:	**50 questions**

2. **All** questions are compulsory.
3. You will be supplied the Answer Sheet separately by the Invigilator. You must complete the details of particulars asked for.
4. Answer must be shown by completely blackening the corresponding circle in the Answer Sheet against the relevant question number by Black Ballpoint Pen. OMR Answer Sheet without marking Series shall not be evaluated.

   Example :
   Suppose the following question is asked :

   The Capital of Meghalaya is

   (A) Guwahati
   (B) Kohima
   (C) Shillong
   (D) Delhi

   You will have four alternatives in the Answer Sheet for your response corresponding to each question of the Question Booklet as below :

   Ⓐ Ⓑ Ⓒ Ⓓ

   In the above illustration, if your chosen response is alternative (C), i.e., Shillong, then the same should be marked on the Answer Sheet by blackening the relevant circle with a Black Ballpoint Pen only as below :

   Ⓐ Ⓑ ● Ⓓ

   The example shown above is the only correct method of answering.
5. Answer the questions as quickly and as carefully as you can. Some questions may be difficult and others easy. Do not spend too much time on any one question.
6. There will NOT be any negative marking for wrong answers.
7. The Answer Sheet must be handed over to the Invigilator before you leave the Examination Hall.
8. No Rough Work is to be done on the Answer Sheet. Space for Rough Work has been provided in the Question Booklet.

SEAL

PART—A : GENERAL ENGLISH

(*Marks* : 100)

Each question carries **2** marks

Directions **(Q. Nos. 1–5) :**

In the following sentences, some parts have errors and some have none. Find out which part of a sentence (A), (B) and (C) has an error and select that part as the answer. If there is no error, then (D) is the answer.

1. He was anxious about his family (A) / who were (B) / travelling abroad. (C) / No Error (D)

2. A change at the law (A) / would be (B) / to everyone's benefit. (C) / No Error (D)

3. As a soldier, he dutifully (A) / followed at his (B) / commander's instructions. (C) / No Error (D)

4. It is arrogance by Rakesh (A) / to think (B) / that he will win every time. (C) / No Error (D)

5. This research merely duplicates (A) / work already (B) / done anywhere. (C) / No Error (D)

Directions **(Q. Nos. 6–15) :**

Select the word that is most similar in meaning to the given word.

6. Abrogate

(A) cancel

(B) close

(C) eat

(D) prohibit

7. Ameliorate

(A) destroy

(B) improve

(C) increase

(D) clean

8. Bedlam

(A) agree

(B) rest

(C) negotiate

(D) confusion

9. Bleary

(A) loud

(B) gentle

(C) blurred

(D) flawless

10. Cadaverous
(A) pale
(B) caring
(C) bold
(D) intelligent

11. Chagrin
(A) trick
(B) saintly
(C) lovely
(D) embarrassment

12. Delinquent
(A) negligent
(B) backward
(C) dishonest
(D) restrict

13. Duress
(A) decision
(B) prudent
(C) analyze
(D) threat

14. Effervescent
(A) smart
(B) powerful
(C) lively
(D) cunning

15. Egregious
(A) powerful
(B) smooth
(C) shiny
(D) bad

Directions **(Q. Nos. 16–25) : Select the word that is opposite in meaning to the given word.**

16. Extravagant
(A) real
(B) thrifty
(C) obscure
(D) fun

17. Aquatic
(A) terrestrial
(B) antique
(C) water
(D) lake

18. Punctual
(A) smart
(B) timely
(C) tardy
(D) regular

19. Chronological
(A) random
(B) orderly
(C) pattern
(D) style

20. Camouflage
(A) mask
(B) forest
(C) army
(D) uncover

21. Hypocrite

(A) cunning

(B) honest

(C) wicked

(D) crafty

22. Incredulous

(A) persistent

(B) trusting

(C) hardworking

(D) idle

23. Adversary

(A) ally

(B) challenge

(C) rival

(D) trouble

24. Victim

(A) target

(B) immature

(C) assailant

(D) sufferer

25. Taunt

(A) thin

(B) ridicule

(C) jeer

(D) respect

Directions **(Q. Nos. 26–35) :**
For the given idioms in italics, choose the best alternative that expresses the closest meaning of the idiom.

26. He invited *all and sundry* in the marriage party of his younger sister.

(A) selected guests

(B) with some exceptions

(C) without making any distinction

(D) all the colleagues

27. He does nothing without self-interest; all his excuses are but *an eyewash.*

(A) an eye solution

(B) water treatment

(C) a fast movement

(D) a pretence

28. He is *a gentleman at large*, you must not trust him.

(A) an agreeable man

(B) an unreliable person

(C) a polite man

(D) a reliable person

29. Until I get a hold of the appointment, I was not sure of posting, as there are many slips *between the cup and the lips.*

(A) on the point of achievement

(B) just at the point of losing

(C) away at the point of achievement

(D) before the time of achievement

30. Seema goes to the temple *ever and anon.*

(A) then and never

(B) most of the time

(C) now or never

(D) now and then

31. The USA has threatened Iraq with *fire and brimstone* if she refuses to follow the resolutions of UNO.

(A) prideful penalties

(B) desirable consequences

(C) fearful penalties

(D) unavoidable consequences

32. Her remarks about his father were *gall and wormwood* to him.

(A) source of irritation

(B) source of happiness

(C) source of hopefulness

(D) source of change in perspective

33. We should *gird up the loin* to fight the menace of poverty and illiteracy.

(A) to wait patiently

(B) to guard against lions

(C) to cover oneself decently

(D) to be ready

34. To get oneself selected in the IAS is *a herculean task* for everybody.

(A) a tedious job

(B) an easy job

(C) a Greek job

(D) a mythological job

35. The officer adopted *hole and corner policy* to get his Personal Assistant transferred.

(A) an open policy for an evil purpose

(B) a secret policy for an evil purpose

(C) a secret policy for a good purpose

(D) an open policy for a good purpose

Directions **(Q. Nos. 36–50) : Choose the correct alternative to fill in the blanks.**

36. Health is too important to be _____.

(A) despised

(B) discarded

(C) detested

(D) neglected

37. A _____ is generally defined as a piece of land surrounded on most sides by water.

(A) peninsula

(B) isthmus

(C) strait

(D) gulf

38. A _____ is a length of water wider than a strait, joining two larger areas of water, especially two seas.

(A) bank

(B) shore

(C) channel

(D) bay

39. A _____ is a summary or abstract of a text or speech.

(A) text

(B) passage

(C) précis

(D) sentence

40. Peter is a strong _____ of democracy.

(A) advocate

(B) protagonist

(C) benefactor

(D) mentor

41. In the Cries or Call of Birds/Animals, an Ape would _____.

(A) bellow

(B) growl

(C) bray

(D) gibber

42. In the Cries or Call of Birds/Animals, a Bull would _____.

(A) bellow

(B) neigh

(C) snore

(D) bleat

43. In the Cries or Call of Birds/Animals, an Eagle would _____.

(A) moo

(B) quack

(C) scream

(D) coo

44. In the Cries or Call of Birds/Animals, a Goose would _____.

(A) hum

(B) cackle

(C) quack

(D) chirp

45. In the Cries or Call of Birds/Animals, a Swallow would _____.

(A) squeak

(B) queak

(C) hoot

(D) twitter

46. The journey soon became _____.

(A) tedious

(B) porous

(C) tenuous

(D) malicious

47. Sometimes truth is stranger than _____.

(A) falsehood

(B) lies

(C) history

(D) fiction

48. The young one of a goat is called a _____.

(A) cub

(B) kid

(C) goatee

(D) calf

49. A place of burial is called a _____.

(A) cemetery

(B) symmetry

(C) hillock

(D) morgue

50. A person who walks in sleep is known as a _____.

(A) teetotaller

(B) nightmare

(C) somnambulist

(D) recluse

PART—B : GENERAL KNOWLEDGE

(*Marks* : 100)

Each question carries **2** marks

51. What is the period of the Indus Valley Civilization?

(A) 1500–1000 BC

(B) 3000–1500 BC

(C) 5000–1000 BC

(D) 2000–1000 BC

52. Who composed India's national song?

(A) Rabindranath Tagore

(B) Subhas Chandra Bose

(C) Bankim Chandra Chatterjee

(D) Lala Lajpat Rai

53. Who was the British Governor-General of free India?

(A) Lord Louis Mountbatten

(B) Lord T. B. Macaulay

(C) Lord Wavell

(D) Lord Linlithgow

54. Green Revolution in India is also known as

(A) seed, fertilizer and irrigation revolution

(B) food security revolution

(C) agricultural revolution

(D) multi-crop revolution

55. Citizens and foreigners both enjoy

(A) Political Rights

(B) Fundamental Rights

(C) Civil Rights

(D) Legal Rights

56. The Whitehall is

(A) the office of the US President

(B) the office of the British Government in London

(C) the residence of the US President

(D) the British Queen's summer residence

57. According to the UN 2020 International Migration Report, which country topped the list of migrants living abroad?

(A) China

(B) Mexico

(C) Pakistan

(D) India

58. Paracetamol is used

(A) to relieve body pain

(B) as an antibiotic

(C) as a balm

(D) as a nasal drop

59. The Sarnath pillar is an example of the

(A) Harappan art

(B) Mughal art

(C) Mauryan art

(D) Chola art

60. In which State is the Buddhist site Tabo Monastery located?

(A) Arunachal Pradesh

(B) Sikkim

(C) Himachal Pradesh

(D) Meghalaya

61. The term 'Lubb and Dubb' is related to which one of the following?

(A) Heart

(B) Eyes

(C) Teeth

(D) Lungs

62. Which one of the following South Asian countries has the highest population Density?

(A) India

(B) Nepal

(C) Pakistan

(D) Sri Lanka

63. 'Prince of Wales Cup' is associated with the game of

(A) polo

(B) basketball

(C) golf

(D) volleyball

64. Who formulated the laws of motion and the law of universal gravitation?

(A) Isaac Newton

(B) Albert Einstein

(C) David Gregory

(D) Stephen Hawking

65. Which is the smallest and innermost planet in our solar system?

(A) Venus

(B) Mars

(C) Mercury

(D) Neptune

66. The Khalji Sultans of Delhi were

(A) Mongols

(B) Afghans

(C) Turks

(D) Jat tribe

67. Who among the following was the founder of the Muslim League?

(A) Muhammad Ali Jinnah

(B) Shaukat Ali

(C) Nawab Salimullah

(D) Aga Khan

68. Who among the following had started the Public Works Department in India in AD 1848?

(A) Lord William Bentinck

(B) Lord Dalhousie

(C) Lord Wellesley

(D) Lord Cornwallis

69. Which one of the following, when dissolved in H_2O, gives hissing sound?

(A) Limestone

(B) Slacked lime

(C) Soda lime

(D) Quicklime

70. In which of the following years the Fundamental Duties have been added to the Constitution of India?

(A) 1965

(B) 1976

(C) 1979

(D) 1982

71. Who has been appointed as the new ISRO Chief in 2022?

(A) K. Sivan

(B) A. S. Kiran Kumar

(C) K. Radhakrishnan

(D) S. Somanath

72. Yellow fever is transmitted by

(A) Aedes

(B) Anopheles

(C) Housefly

(D) Culex

73. Holding a 'Bandh' was declared illegal for the first time in India by which one of the following High Courts?

(A) Rajasthan High Court

(B) Gujarat High Court

(C) Kerala High Court

(D) Maharashtra High Court

74. The letters 'RSVP' at the end of a letter mean

(A) please confirm

(B) please do not answer

(C) please refer

(D) please answer

75. Woollen clothes are warmer than cotton clothes because they are

(A) better absorbers of heat

(B) better insulators of heat

(C) better radiators of heat

(D) heavier than cotton clothes

76. Who is the author of the book, *Pathway to God*?

(A) Mahatma Gandhi

(B) Sri Aurobindo

(C) Jawaharlal Nehru

(D) Sardar Vallabhbhai Patel

77. A place where the Buddhist monks live is

(A) temple

(B) stupa

(C) monastery

(D) pagoda

78. What is the name of the first Indian satellite in space?

(A) METSAT

(B) KALPANA–1

(C) Aryabhata

(D) INSAT–3D

79. Which is the largest desert on the Earth?

(A) The Sahara

(B) Australian desert

(C) Arabian desert

(D) The Gobi

80. When was the United Nations Organization established?

(A) 1st January, 1920

(B) 24th October, 1945

(C) 1st January, 1942

(D) 5th April, 1949

81. Total number of the Lok Sabha seats in Meghalaya is

(A) two

(B) five

(C) six

(D) None of the above

82. The Mawlynnong village, which is known as Asia's cleanest village, is located in

(A) Ri Bhoi

(B) East Khasi Hills

(C) West Khasi Hills

(D) South Garo Hills

83. Who was the candidate for the President of India from Meghalaya in 1992?

(A) B. B. Lyngdoh

(B) Tridib Choudhury

(C) George Gilbert Swell

(D) Williamson A. Sangma

84. Which country shares its international border with Meghalaya?

(A) Nepal

(B) Bhutan

(C) Bangladesh

(D) Myanmar

85. Who coined the term 'Meghalaya'?

(A) H. G. Sangma

(B) S. P. Chatterjee

(C) Kazi Nazrul Islam

(D) Rabindranath Tagore

86. The Asian Games are organized after every

(A) 3 years

(B) 4 years

(C) 5 years

(D) 6 years

87. Greenwich Mean Time (GMT) is the standard time of which of the following countries?

(A) India

(B) Japan

(C) UK

(D) France

88. The Indian National calendar is based on the

(A) Christian era

(B) Saka era

(C) Vikram era

(D) Hijri era

89. Which of the following is a device used to store electric charge?

(A) Inductor

(B) Capacitor

(C) Resistor

(D) Transformer

90. What is the number of spokes in the Dharmachakra in the National Flag of India?

(A) 16

(B) 18

(C) 22

(D) 24

91. Who was the first Speaker of the Independent India's Lok Sabha?

(A) G. V. Mavalankar

(B) Rabi Ray

(C) Hukam Singh

(D) Bali Ram Bhagat

92. Where is the Central Rice Research Institute located?

(A) Bengaluru

(B) Kanpur

(C) Coimbatore

(D) Cuttack

93. What does the airbag, used for safety of car driver, contain?

(A) Sodium bicarbonate

(B) Sodium azide

(C) Sodium nitrite

(D) Sodium peroxide

94. The percentage of plasma in the total blood volume in human beings is about

(A) 45

(B) 50

(C) 55

(D) 60

95. Dry ice is

(A) solid ice without water

(B) benzoic acid

(C) glacial acetic acid

(D) solid carbon dioxide

96. The President of India enjoys emergency powers of

(A) four types

(B) two types

(C) five types

(D) three types

97. Goa was previously ruled by the

(A) Portuguese

(B) British

(C) French

(D) Spanish

98. Which music album won the 'Album of the Year' honour at the 64th Annual Grammy Awards in 2022?

(A) We Are

(B) Daddy's Home

(C) Love for Sale

(D) Sour

99. Which is the highest civilian award of the Republic of India?

(A) Padma Bhushan

(B) Bharat Ratna

(C) Padma Vibhushan

(D) Padma Shri

100. Who won the Nobel Peace Prize for 2021?

(A) Maria Ressa and Dmitry Muratov

(B) World Food Programme

(C) Abiy Ahmed Ali

(D) Denis Mukwege and Nadia Murad

PART—C [Choose any ONE subject from the following]

AGRICULTURAL ENGINEERING

(*Marks* : 100)

Each question carries **2** marks

101. The main purpose of homogenization in milk is to

(A) kill bacteria

(B) prevent cream separation

(C) remove water

(D) reduce temperature

102. In agriculture, motor overloading is often due to

(A) high-voltage supply

(B) low-voltage supply

(C) low water table

(D) All of the above

103. The combine harvester performs

(A) harvesting only

(B) harvesting + threshing

(C) harvesting + threshing + cleaning

(D) harvesting + transportation

104. You are designing a farmstead in a waterlogged area. Which structure should be raised the highest above ground level?

(A) Farmhouse

(B) Poultry shed

(C) Cowshed

(D) Storage structure

105. Drawdown in a well increases, but the yield decreases. This indicates

(A) aquifer clogging

(B) pump malfunction

(C) reduced pumping

(D) increased recharge

106. In NDVI calculation, if a pixel has NIR = 0·6 and Red = 0·2, NDVI = ?

(A) 0·25

(B) 0·50

(C) 0·75

(D) 1·00

107. You are posted in a hilly region where rainfall is high and slopes are 4%–6%. Which soil conservation measure would you suggest as a priority?

(A) Contour bunds

(B) Bench terraces

(C) Loose boulder check dams

(D) Check dams

108. The duty of water in irrigation is defined as

(A) volume of water required per hectare

(B) area irrigated per unit discharge of water

(C) depth of water applied per irrigation

(D) water use efficiency

109. The optimum floor slope for dairy barn drainage is

(A) 0%

(B) 1%–2%

(C) 4%–5%

(D) above 10%

110. The compression ratio of diesel engines used in tractors is generally

(A) 6 : 1 to 8 : 1

(B) 10 : 1 to 12 : 1

(C) 14 : 1 to 22 : 1

(D) 20 : 1 to 24 : 1

111. The cut-in speed of most agricultural windmills is around

(A) 1–2 m/s

(B) 3–4 m/s

(C) 6–8 m/s

(D) 8–10 m/s

112. Angle of repose is

(A) angle between the free surface of the pile and the horizontal

(B) angle between the silo wall and the vertical

(C) slope of conveyor belt

(D) angle between two rollers

113. ASCII code is used for

(A) audio compression

(B) video transmission

(C) image storage

(D) character encoding

114. The material handling method least suitable for long vertical lifting is

(A) bucket elevator

(B) screw conveyor

(C) belt conveyor

(D) pneumatic conveyor

115. If the voltage drops from 230 V to 210 V, the motor current

(A) increases

(B) decreases

(C) stays same

(D) stops motor

116. A seed drill calibration shows 0·1 kg seed drop for 2 revolutions of the drive wheel. If the wheel circumference is 2 m and the row spacing is 25 cm with 4 rows, the seed rate is approximately

(A) 100 kg/ha

(B) 150 kg/ha

(C) 200 kg/ha

(D) 250 kg/ha

117. If the relative humidity inside a polyhouse is too high, which of the following is the first corrective action?

(A) Add foggers

(B) Reduce shading

(C) Reduce irrigation frequency

(D) Increase ventilation openings

118. In drip irrigation using saline water, the best practice is to

(A) increase irrigation interval

(B) reduce irrigation interval with small doses

(C) apply heavy seasonal leaching

(D) flood irrigate periodically

119. Wetland mapping from remote sensing requires special care because

(A) wetlands have mixed land-water spectral signatures

(B) they are always deep-water bodies

(C) they do not reflect light

(D) they cannot be detected from space

120. The Forest (Conservation) Act, 1980 primarily regulates

(A) forest exploitation

(B) diversion of forestland for non-forest use

(C) plantation drives

(D) tree harvesting methods

121. The available water for plant in soil is the difference between

(A) saturation and field capacity

(B) field capacity and hygroscopic water

(C) field capacity and permanent wilting point

(D) saturation and wilting point

122. The main factor for site selection of a farmstead is

(A) distance from city

(B) soil fertility

(C) availability of water and accessibility

(D) type of crops grown

123. The term 'animate source of power' refers to

(A) solar and wind power

(B) steam engines

(C) human and animal power

(D) electrical power

124. The major share of energy in crop production is used for

(A) irrigation

(B) sowing

(C) harvesting

(D) fertilizer application

125. An oscillator generates

(A) continuous AC signal without external input

(B) continuous DC signal without external input

(C) pulses only when triggered

(D) no signal

126. Fresh maize (moisture content 40% wet basis) is to be dried to 20% wet basis. Calculate the water to be removed from 1000 kg initial weight.

(A) 150 kg

(B) 200 kg

(C) 225 kg

(D) 250 kg

127. The maximum theoretical power that can be extracted by a windmill from the wind is

(A) 69·3% of wind power

(B) 56·3% of wind power

(C) 49·3% of wind power

(D) 59·3% of wind power

128. The 'tractive efficiency' of a tractor is the ratio of

(A) drawbar power to axle power

(B) PTO power to engine power

(C) engine power to drawbar pull

(D) axle power to wheel slip

129. The first step in post-harvest handling of fruits and vegetables is

(A) harvesting

(B) storage

(C) washing and sorting

(D) packaging

130. In a multivibrator used for pulse generation, increasing the capacitor value will

(A) increase the pulse frequency

(B) decrease the pulse frequency

(C) keep the pulse frequency same

(D) stop oscillation

131. The main advantage of subsurface drainage over surface drainage is

(A) lower cost

(B) better removal of excess water from the root zone

(C) easier construction

(D) no maintenance

132. For drought monitoring, combining rainfall anomaly maps with NDVI maps in GIS is an example of

(A) spatial correlation analysis

(B) spectral index calculation

(C) temporal averaging

(D) network routing

133. The term 'aerial photography' refers to photographs taken from

(A) ground level

(B) elevated tower

(C) aircraft or drone

(D) satellite

134. The 'Universal Soil Loss Equation' (USLE) is used to estimate

(A) rainfall intensity

(B) runoff volume

(C) annual soil loss

(D) sediment particle size

135. False Colour Composite (FCC) images are mainly used for

(A) weather prediction

(B) vegetation and land cover mapping

(C) road network mapping only

(D) mineral exploration only

136. Watershed development work plan includes

(A) engineering structures

(B) vegetative measures

(C) socio-economic interventions

(D) All of the above

137. A governor controls engine speed mainly by

(A) varying fuel injection quantity

(B) changing the gear ratio

(C) adjusting tyre size

(D) reducing exhaust temperature

138. A thermistor's resistance decreases with temperature. This is a/an

(A) positive temperature coefficient device

(B) negative temperature coefficient device

(C) constant resistance device

(D) inductive device

139. The main objective of soil and water conservation is

(A) to increase soil fertility only

(B) to minimize soil erosion and optimize water use

(C) to improve soil colour

(D) to remove weeds from the soil

140. Land use/land cover classification from satellite data helps in

(A) urban planning

(B) agricultural crop monitoring

(C) watershed management

(D) All of the above

141. The most common device for measuring small canal discharges is

(A) weir

(B) Parshall flume

(C) current meter

(D) orifice meter

142. In cold climates, poultry house orientation for maximum sunlight is

(A) East–West

(B) North–South

(C) NE–SW

(D) any direction

143. Screw conveyors move material by

(A) drag

(B) helical blade rotation

(C) pneumatic force

(D) belt movement

144. Which soil texture is most susceptible to wind erosion?

(A) Clay

(B) Loam

(C) Silt loam

(D) Sand

145. The optimum temperature for safe grain storage is

(A) 0 °C – 5 °C

(B) 10 °C – 15 °C

(C) 20 °C – 25 °C

(D) above 30 °C

146. Flood routing is used to

(A) increase flood peaks

(B) estimate the flood hydrograph through a reservoir

(C) measure rainfall

(D) calculate evaporation

147. If a farmer uses a diesel engine pump (12 hp) for 6 hours/day at 0·25 L/hp-h, the daily fuel consumption is

(A) 16 L

(B) 18 L

(C) 20 L

(D) 21 L

148. Post-harvest losses in cereals in India are generally estimated to be

(A) 5% – 10%

(B) 10% – 15%

(C) 15% – 20%

(D) 20% – 25%

149. In agricultural engineering, micro-processors are used for

(A) data acquisition

(B) process control

(C) automation

(D) All of the above

150. In gully control, a drop spillway is chosen over a loose boulder check dam when

(A) flow is temporary and small

(B) structure needs to be permanent and handle high flows

(C) only local stones are available

(D) farmers have a low budget

CIVIL ENGINEERING

(*Marks* : 100)

Each question carries **2** marks

101. Who is the pioneer of the Portland cement industry?

(A) William Aspdin

(B) Royston Saint John

(C) Joseph Aspdin

(D) None of them

102. Gypsum is added to cement for

(A) providing high strength to the cement

(B) controlling the initial setting time of the cement

(C) lowering the clinkering temperature of the cement

(D) All of the above

103. The trunk of a tree left after cutting all the branches is known as

(A) log

(B) batten

(C) plank

(D) baulk

104. In which of the following directions, the strength of timber is maximum?

(A) Parallel to grains

(B) 45° to grains

(C) Perpendicular to grains

(D) Same in all directions

105. The number of bricks required for one cubic meter of brick masonry is

(A) 400

(B) 450

(C) 500

(D) 550

106. The simplest space frame or truss consists of six members joined to form

(A) tetrahedron

(B) hexahedron

(C) dodecahedron

(D) octahedron

107. If the member is denoted by m and joints by j, the condition for a frame to be redundant is given by

(A) $m < 2j + 3$

(B) $m < 2j - 3$

(C) $m > 2j - 3$

(D) $m > 2j + 3$

108. When 1 cm on the map represents 10 m on the ground, the representative fraction of the scale is

(A) $\frac{1}{10}$

(B) $\frac{1}{100}$

(C) $\frac{1}{10000}$

(D) $\frac{1}{1000}$

109. If the chain length used in measuring distance is longer than the standard length, the error in the measured distance will be

(A) negative error

(B) positive error

(C) compensating error

(D) All of the above

110. If x is the smallest division on a scale and n is the number of divisions on a vernier, then the least count of the vernier is

(A) $x+n$

(B) $x-n$

(C) $\frac{x}{n}$

(D) $x \cdot n$

111. The line joining some fixed points on the main survey line is called

(A) check line

(B) tie line

(C) base line

(D) None of the above

112. The maximum values of centrifugal ratio on roads and railways respectively are taken as

(A) $\frac{1}{4}$ and $\frac{1}{6}$

(B) $\frac{1}{6}$ and $\frac{1}{8}$

(C) $\frac{1}{4}$ and $\frac{1}{8}$

(D) $\frac{1}{8}$ and $\frac{1}{4}$

113. A liquid flows with the same velocity through two pipes 1 and 2 having the same diameter. If the length of the second pipe be twice that of the first pipe, what should be the ratio of the head loss in the two pipes?

(A) 1 : 2

(B) 3 : 1

(C) 1 : 4

(D) 4 : 1

114. When is an orifice called 'large orifice'?

(A) If the head of liquid is less than 5 times the depth of orifice

(B) If the head of liquid is less than 2·5 times the depth of orifice

(C) If the head of liquid is less than 4 times the depth of orifice

(D) If the head of liquid is less than 1·5 times the depth of orifice

115. For a given discharge in case of a rectangular channel, the critical flow depth depends upon

(A) channel geometry only

(B) channel geometry and bed slope

(C) channel geometry and bed roughness

(D) channel geometry, bed slope and bed roughness

116. In a hydraulic jump occurring in a horizontal rectangular channel, the sequent depths are 0·25 m and 1·25 m. The energy loss in the jump is

(A) 1·5 m

(B) 1 m

(C) 1·25 m

(D) 0·8 m

117. The rectangular channel will be most economical when

(A) the width of the channel is half the flow depth

(B) the width of the channel is twice the flow depth

(C) the flow depth is two times the width of the channel

(D) the flow depth is three times the width of the channel

118. Calculate the wetted perimeter for a rectangular channel having top width of 4·5 m and depth of 3 m.

(A) 12 m

(B) 10·5 m

(C) 7·5 m

(D) 15 m

119. For a channel to be economic, which of the following parameters should be minimum?

(A) Wetted perimeter

(B) Wetted area

(C) Section factor

(D) Hydraulic depth

120. A hydraulic jump occurs in an open channel when the slope of the channel changes from

(A) mild slope to steep slope

(B) steep slope to mild slope

(C) mild slope to zero slope

(D) steep slope to a steeper slope

121. A rectangular channel with gradually varied flow has a changing bed slope. If the change is from a steeper slope to a steep slope, the resulting gradually varied flow profile is

(A) S_3

(B) S_1

(C) S_2

(D) either S_1 or S_2, depending on the magnitudes of the slopes

122. What is the size of a raindrop?

(A) Greater than 8 mm

(B) Between 0·5 mm and 6 mm

(C) Less than 0·5 mm

(D) Between 8 mm and 10 mm

123. What is drainage density?

(A) $\frac{\text{Total channel width}}{\text{Total drainage area}}$

(B) $\frac{\text{Total channel length}}{\text{Total drainage area}}$

(C) $\frac{\text{Total drainage area}}{\text{Total channel length}}$

(D) $\frac{\text{Total drainage area}}{\text{Total channel width}}$

124. Unit hydrograph theory was enunciated by

(A) Merrill Bernard

(B) W. W. Horner

(C) Le-Roy K. Sherman

(D) Robert E. Horton

125. The Hargreaves method is commonly used for estimating which parameter in hydrology?

(A) Runoff coefficient

(B) Infiltration rate

(C) Evapotranspiration

(D) Groundwater recharge

126. Which of the following is a characteristic of an artesian well?

(A) Requires a pump for extraction

(B) Water level above ground surface

(C) Low hydraulic gradient

(D) Occurs in unconfined aquifers

127. According to Dalton's law of evaporation, the process of evaporation ceases when which of the following conditions is met?

(A) Saturation vapour pressure = Atmospheric pressure

(B) Saturation vapour pressure < Actual vapour pressure

(C) Saturation vapour pressure > Actual vapour pressure

(D) Saturation vapour pressure = Actual vapour pressure

128. When a canal and a drainage approach each other at the same level, the structure so provided is

(A) aqueduct

(B) level crossing

(C) syphon

(D) None of the above

129. The first watering before sowing the crop is called

(A) paleo

(B) kor period

(C) delta

(D) base period

130. The amount of irrigation water required to meet the evapotranspiration needs of the crop during its full growth is called

(A) effective rainfall

(B) consumptive use

(C) CIR

(D) NIR

131. Consider the following statements :

Statement I :

The duty of water decreases as the point of its measurement moves away from the field of application.

Statement II :

Duty depends on soil characteristics.

Select the correct answer using the codes given below.

(A) Both statements are correct

(B) Statement I is correct and Statement II is incorrect

(C) Statement I is incorrect and Statement II is correct

(D) Both statements are incorrect

132. Which one of the following practices causes reduction in the per capita water consumption?

(A) Good quality water

(B) Hotter climate

(C) Modern living

(D) Metering system

133. The multiplying factor, as applied to obtain the maximum daily water demand, in relation to the average, i.e., per capita daily demand, is

(A) 1·5

(B) 1·8

(C) 2·0

(D) 2·7

134. Coincident draft, in relation to water demand, is based on

(A) peak hourly demand

(B) maximum daily demand

(C) maximum daily demand + fire demand

(D) Greater of (A) and (C)

135. For water supply to a medium town, the daily variation factor is

(A) 1·5

(B) 2·5

(C) 3

(D) 3·5

136. For non-scouring velocity 5 m/s, the type of sewers generally preferred to, is

(A) cast iron sewers

(B) cement concrete sewers

(C) glazed bricks sewers

(D) None of the above

137. The correct relationship among theoretical oxygen demand (TOD), biological oxygen demand (BOD) and chemical oxygen demand (COD) is

(A) TOD > BOD > COD

(B) BOD > COD > TOD

(C) TOD > COD > BOD

(D) COD > BOD > TOD

138. The wastewater from bathrooms, kitchen, etc., is called

(A) refuse

(B) sullage

(C) sewage

(D) garbage

139. Which air pollutant causes corrosion of building?

(A) SO_2

(B) SO_3

(C) CO

(D) NO_2

140. Which of the following is a secondary air pollutant?

(A) SPM

(B) PAN

(C) SO_2

(D) CO

141. Which of the following gases is more in percentage in the air?

(A) Oxygen

(B) Nitrogen

(C) Argon

(D) Carbon dioxide

142. The minimum value of camber provided for thin bituminous surface hill roads is

(A) 2·2%

(B) 2·5%

(C) 3·0%

(D) 3·5%

143. The thickness of a pavement may be reduced considerably by

(A) compaction of soil

(B) stabilization of soil

(C) drainage of soil

(D) Combination of all the above

144. For the movement of vehicles at an intersection of two roads, without any interference, the type of grade separator generally preferred to, is

(A) delta

(B) trumpet

(C) diamond interchange

(D) clover leaf

145. As per the recommendations of IRC, traffic volume study is carried out for rural roads for 7 days continuously during

(A) harvesting

(B) lean season

(C) harvesting and lean season

(D) None of the above

146. The Border Roads Organization was established in the year

(A) 1947

(B) 1954

(C) 1960

(D) 1958

147. Who is the father of soil mechanics?

(A) Darcy

(B) Dr. Karl Terzaghi

(C) R. R. Proctor

(D) Mohr

148. The soil that got transported by wind is termed as

(A) colluvial

(B) aeolian

(C) lacustrine

(D) alluvial

149. Quicksand is

(A) moist sand containing fine particles

(B) fine sand flowing easily

(C) the condition in which a cohesionless soil loses all its shear strength due to upward flow of water

(D) None of the above

150. If G is specific gravity and e is void ratio, the critical gradient of seepage of water in a soil mass is given by

(A) $\frac{1-G}{1+e}$

(B) $\frac{G-1}{1+e}$

(C) $\frac{1+e}{1-G}$

(D) $\frac{1+e}{G-1}$

WATER RESOURCE ENGINEERING

(*Marks* : 100)

Each question carries **2** marks

101. The quantity of water retained by the sub-soil against gravity is known as

(A) yield

(B) specific yield

(C) specific retention

(D) porosity

102. What is the term for the boundary between the saturated and unsaturated zones in an aquifer?

(A) Water table

(B) Vadose zone

(C) Aquiclude

(D) Capillary fringe

103. The difference in level between the top of a bank and supply level in a canal is called

(A) berm

(B) free board

(C) height of bank

(D) None of the above

104. Leaching is a process

(A) by which alkali salts present in the soil are dissolved and drained away

(B) by which alkali salts in the soil come up with water

(C) of draining excess water of irrigation

(D) which controls waterlogging

105. Which Indian State is world's first Organic State?

(A) Punjab

(B) Assam

(C) Arunachal Pradesh

(D) Sikkim

106. How can we improve the duty of water?

(A) Lining of canals

(B) Construction of weir

(C) Construction of dam

(D) Check dams

107. The top of a capillary zone

(A) lies below the water table at every point

(B) lies above the water table at every point

(C) coincides the water table at every point

(D) None of the above

108. Agronomic measures are adopted where slope is less than

(A) 10%

(B) 20%

(C) 5%

(D) 2%

109. Which of the following is ***not*** an advantage of contour cultivation?

(A) Conserve soil and water

(B) Conserve soil fertility

(C) Increase crop yield

(D) Establishment on undulated bed

110. How many main methods of rainwater harvesting are there?

(A) 1

(B) 2

(C) 3

(D) 4

111. In wind erosion, what is the diameter of particles that are moved by bounce?

(A) 0·1 mm to 0·5 mm

(B) 0·5 mm to 1 mm

(C) 1 mm to 2 mm

(D) 0·01 mm to 0·1 mm

112. In geological erosion, it is assumed that

(A) soil loss is greater than soil formation

(B) soil formation is greater than soil loss

(C) soil loss is equal to soil formation

(D) None of the above

113. Tehri Dam is located in which river?

(A) Gomati River

(B) Ganga River

(C) Bhagirathi River

(D) Yamuna River

114. Which of the following spillways is least suitable to earthen dams?

(A) Ogee spillway

(B) Chute spillway

(C) Side-channel spillway

(D) Shaft spillway

115. A narrow V-shaped valley indicates the choice of

(A) concrete overflow dam

(B) gravity dam

(C) arch dam

(D) earth dam

116. Which among the following is ***not*** an objective for the construction of dam?

(A) To make sure rains occur periodically

(B) Generation of hydropower energy

(C) Providing water supply for domestic and industrial purposes

(D) Providing irrigational facilities

117. Which type of canal ***does not*** need cross drainage structures?

(A) Side slope canal

(B) Contour canal

(C) Watershed canal

(D) None of the above

118. Which canal is ***not*** provided with any headworks for diversion of river water?

(A) Permanent canal

(B) Feeder canal

(C) Perennial canal

(D) Inundation canal

119. In which fall the depth-discharge relationship is unaffected?

(A) Trapezoidal notch fall

(B) Ogee fall

(C) Rapids

(D) Straight glacis fall

120. What is the reason for the construction of baffle wall in baffle fall?

(A) To maintain uniform velocity flow

(B) To ensure formation of hydraulic jump

(C) To reduce soil erosion

(D) To ensure uniform discharge of the flow

121. By what structures, the regulator can control the supplies entering the off-take channel?

(A) Sluice gate

(B) Falls

(C) Piers and planks

(D) Dams

122. Which of the following is ***not*** a form of precipitation?

(A) Water vapour

(B) Hail

(C) Drizzle

(D) Snow

123. Which of the following is ***not*** a common use of unit hydrographs?

(A) Extending flood flow records based on rainfall

(B) Flood forecasting and warning systems

(C) Estimation of time of concentration

(D) Design of hydraulic structures

124. What is the definition of a flood according to Gumbel?

(A) 29th largest flow in a year

(B) Sum of three largest daily flows in a year

(C) Largest flow of a particular month in a year

(D) Largest of 365 daily flows in a year

125. What does the term 'runoff coefficient' represent in hydrology?

(A) The fraction of rainfall that becomes direct runoff

(B) The ratio of peak discharge to total rainfall

(C) The speed at which water flows in a channel

(D) The percentage of precipitation lost to evaporation

126. Which hydrological method is commonly used for estimating flood peaks in ungauged watersheds?

(A) Rational method

(B) SCS curve number method

(C) Unit hydrograph method

(D) None of the above

127. Which of the following is a method used to estimate potential evapotranspiration?

(A) Hazen-Williams equation

(B) Manning's equation

(C) Chezy's equation

(D) Thornthwaite equation

128. Which of the following is ***not*** correct with reference to unit hydrograph?

(A) Unit hydrograph is obtained due to direct runoff

(B) Unit hydrograph is obtained due to unit rainfall excess

(C) Unit hydrograph has no specified duration

(D) In the determination of unit hydrograph, the rainfall occurs uniformly over the catchment

129. What does the term 'unit' mean in unit hydrograph?

(A) Unit width of catchment

(B) Unit area of catchment

(C) Unit volume of base flow

(D) Unit depth of rainfall excess

130. Attracting groynes are built

(A) perpendicular to the bank

(B) inclined downstream

(C) inclined upstream

(D) None of the above

131. Depending on the topography of the river basin, into how many classifications the river reaches are divided?

(A) 3

(B) 4

(C) 5

(D) 1

132. In the meandering process, on which side of the bank erosion takes place?

(A) Convex side

(B) Bottom of the river

(C) Concave side

(D) None of the above

133. Which of the following are known as the formation constants of an aquifer?

(A) Storativity and permeability

(B) Permeability and specific storage

(C) Specific storage and transmissibility

(D) Transmissibility and storativity

134. Pick up the correct statement from the following.

(A) Perched aquifer is found in unconfined aquifer.

(B) The top surface of the water, held in the perched aquifer, is known as perched water table.

(C) Perched aquifer is formed in unconfined aquifer if an impervious layer exists.

(D) All of the above

135. When water is pumped from a well in a homogeneous and isotropic unconfined aquifer, what does the shape of the water table resemble?

(A) Cylinder

(B) Hemisphere

(C) Cone

(D) Helix

136. What is the discharge from an open well corresponding to critical depression head known as?

(A) Minimum yield

(B) Maximum yield

(C) Safe yield

(D) Working yield

137. Which one of the following is ***not*** a component of hydrograph?

(A) Recession limb

(B) Rising arm

(C) Crest

(D) Rising limb

138. For a D-hr unit hydrograph, as the value of D is reduced, what will be the change in peak of the unit hydrograph?

(A) Increases

(B) Decreases

(C) Remains same

(D) May increase or decrease

139. How many peaks does an instantaneous unit hydrograph have?

(A) 0 (B) 1

(C) 2 (D) More than 2

140. The suitable method for forecasting population for a young and a rapidly developing city is

(A) arithmetic mean method

(B) geometric mean method

(C) comparative mean method

(D) None of the above

141. The total water consumption per capita per day, including domestic, commercial and industrial demands for an average Indian city, as per IS code, may be taken as

(A) 135 l/c/d

(B) 210 l/c/d

(C) 240 l/c/d

(D) 270 l/c/d

142. The pipe mains carrying water from the source to the reservoir are designed for the

(A) maximum daily draft

(B) average daily draft

(C) maximum hourly draft of the maximum day

(D) maximum weekly draft

143. Which source of water among the following is ***not*** a surface source?

(A) River

(B) Well

(C) Lake

(D) Ocean

144. Modern turbidimeters, working on the principle of 'scattering of light', are known as

(A) spectrometers

(B) optimeters

(C) tintometers

(D) nephelometers

145. The measure of the amount to which light is adsorbed or scattered by the suspended matter in water is called

(A) opacity

(B) turbidity

(C) celerity

(D) diffraction

146. Maximum permissible limit of fluoride in drinking water should ***not*** exceed

(A) 0·5 ppm

(B) 1·5 ppm

(C) 5 ppm

(D) 10 ppm

147. At what pH, will *E coli* die in water?

(A) 6

(B) 7

(C) 9

(D) >9·5

148. Remote sensing uses which of the following waves in its procedure?

(A) Electric fields

(B) Sonar waves

(C) Gamma rays

(D) Electromagnetic waves

149. Which among the following is ***not*** a phenomenon in case of interaction of electromagnetic waves on the earth surface?

(A) Reflection

(B) Absorption

(C) Transmission

(D) Diffraction

150. Which type of remote sensing uses its own source of electromagnetic energy?

(A) Passive

(B) Active

(C) Satellite

(D) Orbital